MONTANA DIABETES SURVEILLANCE & CLINICAL COMMUNICATION

MONTANA DIABETES PROJECT

Montana Department of Public Health and Human Services
Chronic Disease Prevention and Health Promotion Program
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INCREASING PREVALENCE OF END STAGE RENAL DISEASE (ESRD) ASSOCIATED WITH DIABETES, UNITED STATES, 1988-1997.

In the United States, the number of ESRD cases has increased to over 300,000 cases per year, and the primary diagnosis for over 100,000 of these cases was diabetes (Figure 1). [1] The prevalence of ESRD associated with a diagnosis of diabetes has increased from 22% of all ESRD cases in 1988 to 33% in 1997 (Figure 2). The prevalence of ESRD per million is increasing in both Caucasian and American Indian populations (Figure 3). However, the increase in ESRD prevalence over the past decade is considerably higher among American Indians (Figure 3). This is thought to be due to the increasing prevalence of diabetes in this population.

WHAT'S INSIDE

FIGURE 1.

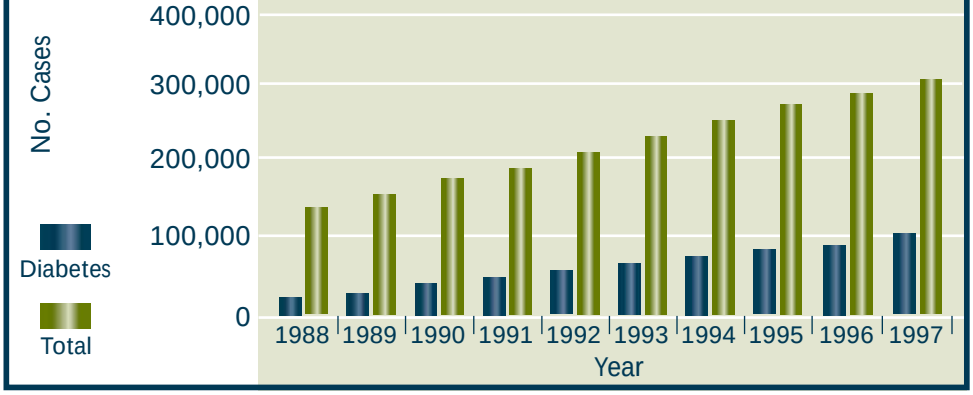


FIGURE 2.

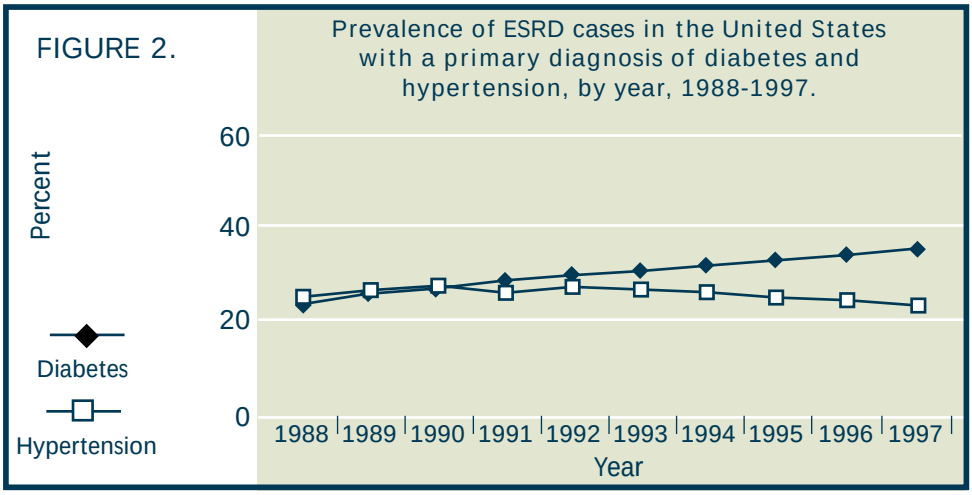
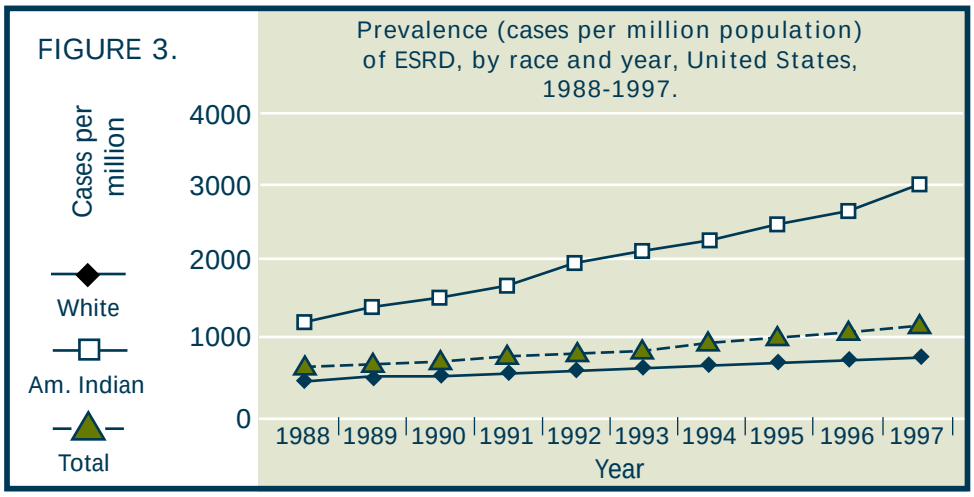


FIGURE 3.



CLINICAL INTERVENTIONS TO DELAY OR PREVENT DIABETIC NEPHROPATHY:

Clinical trials have documented that the rate of progression of diabetic nephropathy can be slowed by a number of strategies including glycemic control, hypertension control, and the use of angiotensin-converting enzyme inhibitors.[2-7] Small amounts of albumin in the urine, termed microalbuminuria (MA), is the earliest sign of diabetic nephropathy. Most authorities recommend routine screening for MA to guide and monitor clinical efforts to delay the progression of nephropathy in persons with diabetes.[8-10] Screening for MA, however, is not straightforward. There is considerable variation from 40-50% day to day differences in urine albumin excretion rates (UAER), in healthy individuals as well as in persons with diabetes. The mean UAER in persons without diabetes is 10 + 3 mg/day or 7.2 ug/min. Over 90% of urine albumin values fall below 20 mg/day. Because the recumbent position decreases UAER, timed specimens collected in the daytime have different rates compared to overnight and 24 hour collections.[11-12] Poor glycemic control, stress, fever, heart failure, hypertension, urinary tract infections and exercise can increase UAER. When these conditions have been excluded, most authorities recommend using a cutoff of 30 mg/day or 20 ug/minute as the lower limit for identifying MA. These thresholds allow for the inherent variation in UAER. Alternatively, an A/C (albumin to creatinine) ratio can be measured on a spot or timed collection and MA is defined as a ratio from 30 to 300 mg/gm. An A/C ratio greater than

References:

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Conclusions:

Our survey of laboratories in Montana indicates that MA testing is not yet provided in all laboratories and where testing is done a variety of units and cutoffs are reported. Thus, primary care physicians face challenges in obtaining and interpreting tests for MA at present. These findings suggest that strategies are needed to increase the availability of MA testing and to promote consistency in reporting of results and recommended cutoffs. This starts with an increased dialogue between the primary care physician and the laboratory. It is important for Montana Physicians to understand the laboratory measures for MA and how the results are reported.

- This survey of laboratories in Montana indicates that MA testing is not yet provided in all laboratories.
- A variety of units and cutoffs are reported that are not consistent with the ADA recommended clinical guidelines.
- Ask your laboratory how they measure and report urine microalbumin results.

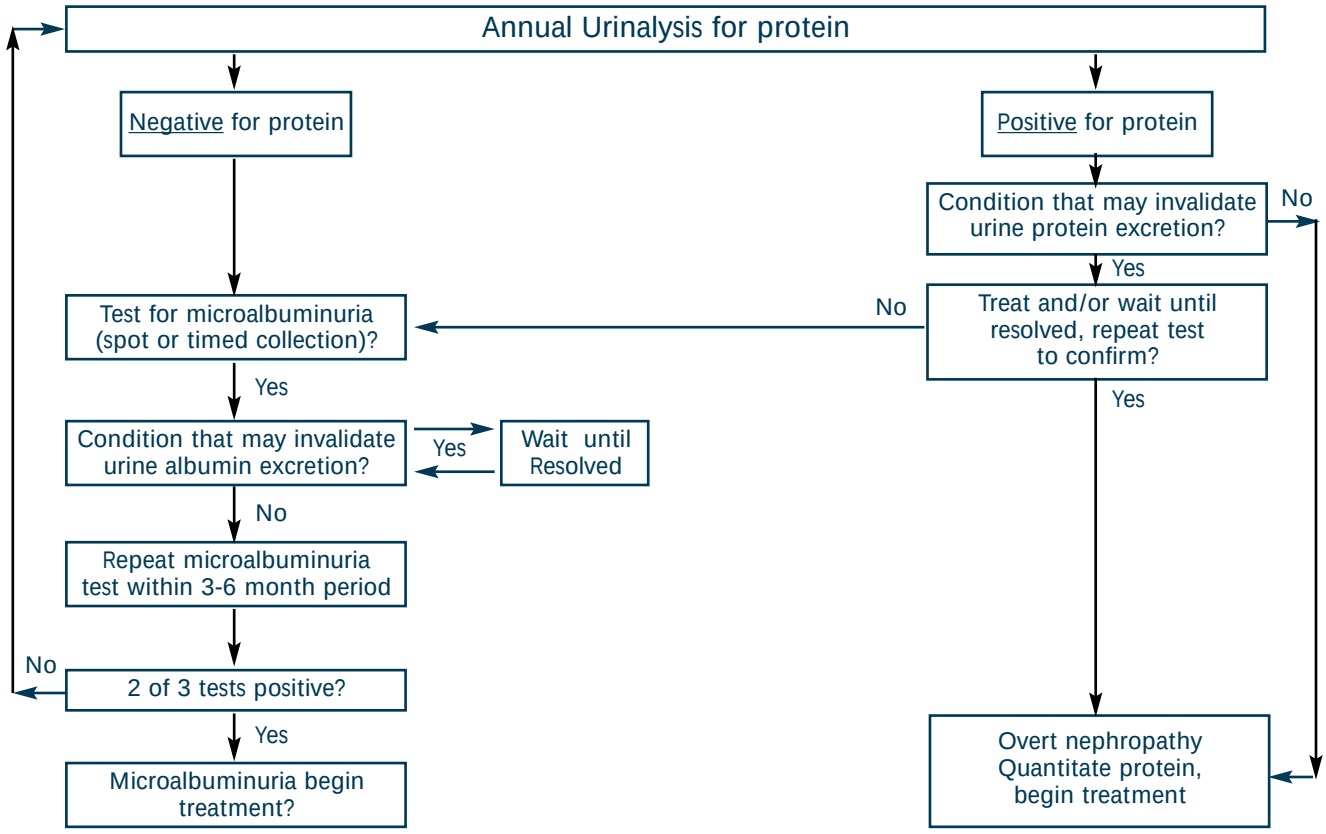
300 mg/gm indicates that overt (dipstick positive) proteinuria is present. The ADA has recommended cutoffs for each of the three tests to determine MA. Table 1 displays the unit for reporting these tests. Random or spot tests for microalbumin concentration without correction for urine concentration are not recommended. Because of the inherent variation in urine albumin excretion, most authorities also recommend that urine albumin levels be measured in 2 out of 3 collections within a 3 to 6 month period before a patient with diabetes is diagnosed as having ìmicroalbuminuria. In summary, screening for MA requires careful coordination between the clinician, the patient and the laboratory. The ADA's suggested clinical algorithm for MA screening is displayed in figure 4.

TABLE 1. The three American Diabetes Association (ADA) recommended tests for microalbumin and the recommended units and cutoffs.

	ADA recommended collection methods		
	24-h collection	Timed collection	Random A/C ratio*
	Recommended reporting units		
	mg/24-hours	ug/minute	Ug/mg Cr.
	Recommended cutoffs		
Normal	<30	<20	<30
Microalbuminuria	30-300	20-200	30-300
Clinical albuminuria	>300	>200	>300

*Albumin to creatinine ratio

FIGURE 4. The American Diabetes Association's suggested clinical algorithm for microalbuminuria screening.



MICROALBUMIN SCREENING PRACTICES OF MONTANA LABORATORIES, 1999.

Background and Methods:

In 1999, the Montana Department of Public Health and Human Services surveyed laboratories in Montana to assess what forms of screening for microalbuminuria (MA) were available and how the results were reported. All 65 clinic and hospital-based laboratories in Montana were surveyed by mail in August 1999 to ascertain if their laboratory provided testing for MA, the methodology used, and the units and cutoffs used to report results. Each laboratory was asked if it performed urine albumin testing on random or spot samples, timed collection, and 24-hour collection, and if they performed and reported A/C ratios. They were also asked to indicate what units they used to report results for each of these measures and what cutoff values were used to report concentrations of albumin in the MA range. Laboratories that reported sending urine samples to a reference laboratory were asked to provide a contact information and these laboratories were also surveyed. Responding laboratories were given the opportunity to verify their initial responses.

Results:

Fifty-two (80%) of the 65 Montana clinic and hospital-based laboratories responded to the survey. Of the 52 responding laboratories, 13 (25%) provided quantitative testing for MA on site, 4 (8%) by qualitative reagent strips only, and 35 (67%) did not perform on-site quantitative assays. Of the 39 that did not test quantitatively, 30 sent specimens to a reference laboratory within or outside of Montana, and 9 neither tested nor referred specimens to a reference laboratory. An additional 4 out-of-state reference laboratories were identified and these laboratories completed the survey. These reference laboratories provided MA testing services to 17 (57%) of the 30 laboratories that sent specimens to outside laboratories. In total 17 labs (13 in Montana and 4 out-of-state) performed at least one form of quantitative MA testing for Montanans with diabetes.

Table 2 displays the frequency with which laboratories perform each of the three tests for MA using the units and cutoffs recommended by the ADA. Overall, 10 (59%) of the 17 laboratories offered at least one of the ADA recommended tests and reported results using units and cutoffs consistent with the recommendations. However, only five (29%) of the 17 laboratories offered these tests exclusively and reported the values in recommended units using the cutoffs published by the ADA.

TABLE 2. Frequency with which laboratories perform each of the three American Diabetes Association (ADA) recommended tests for microalbumin and the percentage using the recommended units and cutoffs, Montana, 1999.

	ADA recommended collection (cutoffs and units)		
	24-h collection (≥30 mg/24-h)	Timed collection (≥20 ug/min)	Random A/C ratio* (≥30 ug/mg Cr.)
	#/total (%)	#/total (%)	#/total (%)
Perform test	12/17 (71)	10/17 (59)	15/17 (88)
Use recommended cutoffs and units	4/12 (33)	4/10 (40)	10/15 (67)

Of the 17 laboratories that provided quantitative testing for MA, all 17 performed random or spot testing. Thirteen reported results in mg/l and used the following cutoffs for MA: >18.0 (n=1), >18.9 (n=2), ≥19.0 (n=2), >20.0 (n=3), ≥30 (n=1), ≥37.0 (n=1), and 3 did not report values for randomly collected specimens. Two laboratories reported random tests in mg/dl with the following cutoffs: ≥1.9 (n=1) and ≥2.0 (n=1). One laboratory reported results for random tests in ug/ml and did not report a cutoff value and one lab did not report units or cutoffs.

Fifteen of the 17 laboratories performed A/C ratios for MA. All 15 reported results in mg/g creatinine and reported the following cutoffs for MA: ≥13.2 (n=3), >15.0 (n=1), >16.0 (n=1), ≥30.0 (n=10).

Ten of the 17 laboratories performed testing for MA from timed urine samples. Five of the 10 laboratories reported results in ug/minute with the following cutoffs for MA: >20.0 (n=1), ≥20.3 (n=3), and ≥25.0 (n=1). Two laboratories reported results in mg/l and used cutoffs of ≥20.0 and ≥30.0. Three laboratories reported results using the following units and cutoffs: mg/minute and ≥11.2, ug/ml and ≥20.0, and mg/dl with no cutoff value reported.

Twelve of the 17 laboratories performed testing for MA from 24-hour collection of urine samples. Ten of these laboratories reported results in mg/24-h with the following cutoffs for MA: ≥11.2 (n=1), ≥15.0 (n=1), ≥25.0 (n=1), >30.0 (n=1), ≥30.0 (n=4), ≥31.0 (n=1), and ≥42.0 (n=1). One laboratory reported results in mg/l with a cutoff of ≥37.0 and one laboratory reported results in ug/g with a cutoff of ≥30.0.

WHAT IS THE MONTANA DIABETES PROJECT AND HOW CAN WE BE CONTACTED:

The Montana Diabetes Project is funded through a cooperative agreement with the Centers for Disease Control and Prevention, Division of Diabetes Translation (U32/CCU815663-02). The mission of the Diabetes Project is to reduce the burden of diabetes and its complications among Montanans. Our web page can be accessed at http://ahec.msu.montana.edu/diabetes/default.htm.

CONTRIBUTORS/ ACKOWLEDGEMENTS:

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